

(For JSPS Fellow)

Form B-5

Date (日付)

25/05/2016 (Date/Month/Year: 日/月/年)**Activity Report -Science Dialogue Program-**

(サイエンス・ダイアログ事業 実施報告書)

- Fellow's name (講師氏名): LI-TA HSU 許 立達 (ID No. P15047)- Participating school (学校名): Tokyo Metropolitan High School of science and technology
東京都立科学技術高校- Date (実施日時): 10/05/2016 (Date/Month/Year: 日/月/年)- Lecture title (講演題目): (in English) How does GPS provide your location!?(in Japanese) GPS での位置推定方法

- Lecture summary (講演概要): Please summary your lecture 200-500 words.

One of the most useful APP in our smartphones is Google Map (or NAVITIME in Japan). This kind of APP helps us to know the direction to go to our destinations. How does these APPs provide the routes for us? The first thing is to decide where you are! How can the APP know where we are? The answer is GPS, Global Positioning System! GPS tells everyone in the world where he/she is in anytime. There are currently 32 GPS satellites in the medium Earth orbit (MEO). These satellites transmit GPS radio frequency signal anytime from the space. GPS receiver demodulates the signal to obtain navigation data, including ephemeris (which is used to describe the model of satellite orbit) and time of signal transmission. With the helps of the information, the receiver can estimate the distance between the satellites and receiver and position of the satellites. As a result, a least square estimation based on the theory of triangulation positioning is used to estimate the position of receiver. Finally, the Japanese QZSS navigation satellite, called Michibiki, is also introduced. The special feature of QZSS is to stay at high elevation angle to provide multipath-free signal. With this characteristic, the QZSS is able to provide more accurate positioning service which is beneficial to many advanced technology such as autonomous driving navigation. The mystery of GPS will be solved in the 5/10 science dialog!

- Language used (使用言語): English

- Lecture format (講演形式):

◆Lecture time (講演時間) 90 min (分), Q&A time (質疑応答時間) 15 min (分)

◆Lecture style (ex.: used projector, conducted experiments)

(講演方法 (例: プロジェクター使用による講演、実験・実習の有無など))

Given a powerpoint using a projector.

- ◆ Interpretation (ex.: assistance by accompanied person, provided Japanese explanation by yourself) (通訳 (例: 同行者によるサポート、講師本人による日本語説明))

assistance by accompanied person

- ◆ Name and title of accompanied person (同行者 職・氏名)

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- ◆ Other note worthy information (その他特筆すべき事項):

Not only several 10s Japanese student but also 10 Taiwanese students join the course.

- Impressions and opinions from accompanied person (同行者の方から、本事業に対する意見・感想等がありましたら、お願いいたします。):